Amendment to the Claims:

The following listing of claims replaces all previous versions and listings of claims:

IN THE CLAIMS

1-4. (Canceled)

5. (Previously presented) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a first selected hologram containing at least a segment of the set of data and having a discrete location and a corresponding address in the memory device, generating thereby an N^{th} diffraction order wavefront;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing the N^{th} diffraction order wavefront diffracted from the hologram;

correlating the N^{th} diffraction order wavefront with a correlation pattern which includes the set of data; where N is an integer;

if a correlation peak occurs, deconvolving the N^{th} diffraction order wavefront and the correlation pattern;

reading the set of data corresponding to the selected hologram and contained in the deconvolved N^{th} diffraction order wavefront; and,

reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the wavelength of one optical beam with respect to the other.

6. (Previously presented) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a first selected hologram containing at least a segment of the set of data and having a discrete location and a corresponding address in the memory device, generating thereby an N^{th} diffraction order wavefront;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing the N^{th} diffraction order wavefront diffracted from the hologram;

correlating the N^{th} diffraction order wavefront with a correlation pattern which includes the set of data; where N is an integer;

if a correlation peak occurs, deconvolving the N^{th} diffraction order wavefront and the correlation pattern;

reading the set of data corresponding to the selected hologram and contained in the deconvolved N^{th} diffraction order wavefront; and,

reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the state of polarization of one optical beam with respect to the other.

7-10. (Canceled)

11. (Previously presented) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a hologram having a discrete location and corresponding address in the memory device generating thereby a interference pattern;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing an N^{th} diffraction order wavefront diffracted from the hologram; where N is an integer;

wherein the N^{th} diffraction order wavefront includes a correlation peak signal and the holographically stored data;

correlating the holographically stored data and the correlation peak signal in the N^{th} diffraction order wavefront;

if a correlation peak occurs, deconvolving the holographically stored data and the correlation peak signal;

reading the set of data in the deconvolved N^{th} diffraction order wavefront; and,

reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the wavelength of one optical beam with respect to the other.

12. (Previously presented) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a hologram having a discrete location and corresponding address in the memory device generating thereby a interference pattern;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing an N^{th} diffraction order wavefront diffracted from the hologram; where N is an integer;

wherein the N^{th} diffraction order wavefront includes a correlation peak signal and the holographically stored data;

correlating the holographically stored data and the correlation peak signal in the N^{th} diffraction order wavefront;

if a correlation peak occurs, deconvolving the holographically stored data and the correlation peak signal;

reading the set of data in the deconvolved N^{th} diffraction order wavefront; and,

reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the state of polarization of one optical beam with respect to the other.

13-14. (Canceled)

15. (Previously presented) A data storage memory device comprising:

a plurality of recording media containing a set of holographically recorded data at discrete memory locations therein wherein each memory location is identified by a corresponding memory address;

means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations in the recording media, generating thereby an N^{th} diffraction order wavefront;

means for sensing the N^{th} diffraction order wavefront emanating from the selected discrete memory location;

means for reading the holographically stored data from the N^{th} diffraction order wavefront;

wherein the plurality of recording media comprise layered holograms and wherein the interference pattern exists over a dimension less than a thickness of the recording media along the direction of travel of the beams of light.

16-18. (Canceled)

19. (Previously Presented) A data storage memory device comprising:

a plurality of recording media containing a set of holographically recorded data at discrete memory locations therein wherein each memory location is identified by a corresponding memory address;

means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations in the recording media, generating thereby an N^{th} diffraction order wavefront; wherein the means for creating an interference pattern between two beams of light comprises a coherent source of light; and wherein the two beams of light are crossed polarized with respect to one another and the means for creating an interference pattern comprises rotating at least one of the beams of light;

means for sensing the N^{th} diffraction order wavefront emanating from the selected discrete memory location; and

means for reading the holographically stored data from the N^{th} diffraction order wavefront.

20. (Canceled)

21. (Currently amended) A data storage memory device comprising:

a plurality of recording media containing a set of holographically recorded data at discrete memory locations therein wherein each memory location is identified by a corresponding memory address;

means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations in the recording media, generating thereby an N^{th} diffraction order wavefront; wherein the means for creating an interference pattern between two beams of light comprises a coherent source of light; and wherein the two beams of light are crossed polarized with respect to one another and the means for creating an interference pattern comprises rotating at least one of the beams of light;

means for sensing the N^{th} diffraction order wavefront emanating from the selected discrete memory location; and

means for reading the holographically stored data from the N^{th} diffraction order wavefront;

wherein the plurality of recording access media ~~comprise media~~ which cause a change in phase of the two beams of light with respect to one another generating thereby non-cross polarized beams of light.

22. (Canceled)